

WHAT IS CLAIMED IS:

1. A method of controlling a thermal print head to print a digital image, the digital image being composed of lines of multi-bit pixels, the print head having a plurality of thermal resistors, adapted to be simultaneously addressed in parallel by a corresponding plurality of shift register elements, the print head being pulsed a plurality of times to print one line of the image, comprising the steps of:

- a) providing a table of additive complement values, one additive complement value for each of the possible values of a multi-bit pixel;
- b) successively adding a complement value to each of the pixel values in a line to obtain a number of sums corresponding to the number of pixels in the line, each sum having an overflow bit that is either "0" or "1", depending on the respective pixel value;
- c) loading the overflow bits of each sum in the line to the shift register elements and applying a printing pulse to the print head;
- d) repeating steps b) and c) for each complement value in the table; and
- e) repeating steps b) to d) for each line of multi-bit pixels in the image.

2. The method as claimed in claim 1, wherein the additive complements in the table have the same bit size as the pixel values such that after the adding step, the overflow bit is generated in the next higher bit position.

3. The method as claimed in claim 1, wherein the additive complements in the table have a bit size greater than the bit size of the pixel values, the bits exceeding the pixel bit size all being "1" bits, such that after the adding step, the overflow bit will be positioned at the next higher bit position of the larger of the two values.

4. The method as claimed in claim 3, wherein the bit size of the additive complements is selected such that the overflow bit is placed at a predetermined position within a 16 bit data word.

5. The method as claimed in claim 4, wherein a plurality of successive overflow bits are generated adjacent to each other within said 16 bit data word and commonly sent out to the print head as a group of modulation bits.

6. The method as claimed in claim 1, wherein the additive complements in the table are arranged in an order such that the modulation bits are arbitrarily distributed within the pixel print period.

7. The method as claimed in claim 1, wherein the table of additive complements repeats one or more of the complement values a number of times, and omits others, thereby providing a non-linear gradation characteristic of the printing system.

8. A thermal printer for printing a digital image composed of lines of multi-bit pixels, comprising:

a) a print head having a plurality of thermal resistors, adapted to be simultaneously addressed in parallel by a corresponding plurality of shift register elements, the print head being pulsed a plurality of times to print one line of the image;

b) means for storing a table of additive complement values, one additive complement value for each of the possible values of a multi-bit pixel;

c) means for successively adding the complement values to each of the pixel values in a line to obtain for each complement value a number of sums corresponding to the number of pixels in the line, each sum having an overflow bit that is either "0" or "1", depending on the respective pixel value;

d) means for loading the overflow bits of each sum in the line to the shift register elements; and

e) means for applying a printing pulse to the print head.

9. The thermal printer claimed in claim 8, further comprising means for successively generating a plurality of overflow bits and for placing the overflow bits adjacent to each other within a 16 bit data word before sending them out to the print head as a group of modulation bits.

10. The thermal printer claimed in claim 8, wherein the additive complements in the table are arranged in an order such that the modulation bits are arbitrarily distributed within the pixel print period.

11. The thermal printer claimed in claim 8, wherein the table of additive complements repeats one or more of the complement values a number of times, and omits others, thereby providing a non-linear gradation characteristic of the printing system.

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